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Hanford Site Fall Protection Program (HSFPP)

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

U.S. DEPARTMENT OF ENERGY

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1.0. SCOPE AND PURPOSE

The requirements of the Hanford Site Fall Protection Program (HSFPP), herein called the Program, apply to all work activities at height or above dangerous equipment. The requirements of the Program are based primarily on Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1926, Subpart M, *Fall Protection, 29 CFR 1910* and American National Standards Institute (ANSI)/American Society of Safety Engineers (ASSE) Z 359 (2007).

For the purpose of this Program the General Industry Standard (29 CFR 1910) requires open-sided floors, platforms, and runways (this includes an elevated working space for persons, such as a balcony or platform for the operation of machinery and equipment; elevated passageways for runways along equipment or a walkway between buildings); wall openings, floor openings and holes; 4 feet or more above adjacent floor or ground level to be guarded by a standard railing (guardrail), barrier, or equivalent. In addition, stairs having four or more risers shall be equipped with a standard stair railing or standard handrails [29 CFR 1910.23]. Other work areas such as construction, demolition or access to other levels shall comply with the fall protection requirements as set forth in this program. For these activities, fall protection is required when employees are exposed to a fall from 6 feet or more to a lower level or any height above dangerous equipment.

For construction activities, as defined in this Program, fall protection is required when employees are exposed to a fall from 6 feet or more to a lower level or any height above dangerous equipment.

Exceptions to the Program are as follows:

- Electrical Utilities (while performing work under 29 CFR 1910.269 and 29 CFR 1926 Subpart V)
- Telecommunications (while performing work under 29 CFR 1910.268)
- Hanford Patrol where activities fall outside the scope described in 29 CFR 1926, Section 500 (a)(1), when it is determined by a Qualified Person that compliance is infeasible or creates a greater hazard to use conventional fall protection equipment. In these cases Hanford Patrol shall implement a Fall Protection Work Permit (FPWP) that provides comparable protection to this Program.
- Hanford Fire Department (HFD) emergency responders when they are equipped with their own protective equipment and devices when training or effecting emergency rescue/retrieval activities.
- Use of Fixed and Portable ladders for access under 24 feet
- Accessing vehicles, trailers and servicing large mobile equipment, not including cranes
  NOTE: *Work at higher elevations may require evaluation by a Competent Person.*
- The Prime Contractor's Cognizant Safety Manager shall approve exceptions where personnel are performing inspections, investigations, and assessments of conditions and are not required to use fall protection, per 29 CFR 1926.500 (a)(1).

To ensure employees are not inadvertently exposed to fall hazards, each work area and process shall be evaluated to ensure engineering controls are in place to prevent exposure to fall hazards. Engineered systems (guardrails, approved work platforms, scaffolds, or vehicle-mounted elevated work platforms) shall be used wherever possible to eliminate potential fall exposure.

2.0. DEFINITIONS

100% Fall Protection: The employee is protected at all times through the use of a fall protection system, fall arrest system, or fall restraint system as identified in the work plan or procedure.

Aerial Lift: Aerial devices used to elevate personnel to job-sites above ground, including extendable boom platforms, aerial ladders, articulating boom platforms, and a combination of any such devices. Aerial equipment may be made of metal, wood, fiberglass reinforced plastic, or other material, may be powered or manually operated, and are deemed to be aerial lifts whether or not they are capable of rotating about a substantially vertical axis.

Anchorage: The terminating component of a fall protection system or rescue system that is intended to support any forces applied to the system.

Anchorage (certified): An anchorage for fall arrest, positioning, restraint, or rescue systems that a Qualified Person certifies to be capable of supporting at least two times the maximum expected force.

Anchorage (non-certified): An anchorage identified by a Competent Person that is capable of supporting at least 5,000 pounds per person.

Authorized User: A person assigned by the employer to perform duties at a location where the person will be exposed to a fall hazard.

Body Belt (safety belt): A strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Cognizant Supervisor: The person that is responsible for the execution of work and/or has the authority to release work or work packages.

Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate such hazards.

Connector: A device which is used to couple (connect) parts of the personal fall arrest system or positioning device systems together. It may be an independent component of the system, such as a self-locking carabineer, or it may be an integral component of part of the system (such as a buckle or Dee-ring sewn into a body harness, or a self-locking snap-hook spliced or sewn to a lanyard or self-retracting lanyard).

Construction: Combination of erection, installation, assembly, demolition, or fabrication activities involved to create a new facility or to alter, add to, rehabilitate, dismantle, or remove an existing facility. It also includes the alteration and repair (including dredging, excavating, and painting) of buildings, structures, or other real property, as well as any construction, demolition, and excavation activities conducted as part of environmental restoration or remediation efforts.

Control Line: A physical boundary line delineating a safe area from an unguarded fall hazard in a controlled-access zone.

Controlled-Access Zone (CAZ): An area in which only overhand bricklaying, precast concrete, or leading edge work may take place without the use of guardrail systems or personal fall arrest systems.

Controlled Roofing Access Zone (CRAZ): A controlled access zone between the warning line and roof's edge used only during low-slope roofing work.

Dangerous Equipment: Equipment (such as acid tanks, degreasing units, machinery, rotating equipment, electrical equipment, and other units) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.

Deceleration Device: Any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, which serves to dissipate a substantial amount of energy during a fall arrest or otherwise limit the energy imposed on an employee during fall arrest.

Deceleration Distance: The additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

Designated Area: A work area used for general industry activities, at or above 4 feet, with a perimeter barrier erected to warn employees when they approach an unprotected side or edge; this also serves to designate an area where work may be performed without additional fall protection.

Equivalent: Alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate shall provide an equal or greater degree of safety for employees than the methods, materials, or designs specified in the standard.

Failure: Load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Fall Arrest: The action or event of stopping a free fall or the instant where the downward free fall has been stopped.

Fall Hazard: Any location where a person is exposed to a potential fall of 6 feet or more, or any distance above dangerous equipment.
Fall Protection Spotter: Designated person that keeps employees and their work activities within the safe area (inside the warning line or control line) and stops any activity which may encroach on the warning line or control line, as designated in the FPWP.

Fall Protection System: Any equipment, device, or system that prevents an accidental fall from elevation or that mitigates the effect of such a fall. Fall protection includes eliminating or controlling hazards, passive fall protection, fall restraint, fall arrest, and administrative controls.

Fall Protection Work Permit (FPWP): A documented process used by the project to determine the fall hazard prevention controls a crew/person shall use to safely perform work that has a fall potential. The FPWP is developed/reviewed by a team consisting of the Cognizant Supervisor, the Safety Representative, the Qualified Person (when required), a Competent Person, and an Authorized User. Controls for the Fall Protection Plan as described in 29 CFR 1926.502 (k) shall be addressed in the FPWP.

Fall Restraint: The technique of securing an authorized user to an approved anchorage using a lanyard short enough to prevent the person's center of gravity from reaching the fall hazard.

Floor Openings: An opening measuring 12 inches or more in its least dimension, in any floor, platform, pavement, or yard through which persons may fall; such as a hatchway, stair or ladder opening, pit, or large manhole (29 CFR 1910).

Free Fall: The act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free Fall Distance: The vertical distance traveled during a fall, measured from the onset of a fall from a walking/working surface to the point at which the fall protection system begins to arrest the fall.

Full Body Harness: Straps which may be secured about the employee in a manner that shall distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

General Industry: Work activities that are not included in agriculture, construction, or maritime. General industries are regulated by OSHA's general industry standards, directives, and standard interpretations.

Guardrail Offset System: A guardrail system around a ladder opening, hoist opening, or other opening in a floor, roof, or guardrail with all sides guarded and the entrance offset to prevent employees from backing into the opening.

Guardrail System: A barrier erected to prevent employees from falling to lower levels.

Hole: A gap or void more than 2 inches in its least dimension in a floor, roof, or other walking/working surface.

Infeasible: That it is impossible to perform the work using a conventional fall protection system (i.e., guardrail system or personal fall arrest system), creates a greater hazard, or that it is technologically impossible to use any one of these systems to provide fall protection. In these situations it is required that methods/systems equivalent to a conventional fall protection system be put in place.

Lanyard: A flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body harness to a deceleration device, lifeline, or anchorage.

Leading Edge: The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.

Lifeline: A component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Locking Snap Hook: A connecting snap hook that requires two separate forces to open the gate; one to deactivate the gate keeper and a second to depress and open the gate which automatically closes when released; used to minimize roll out or accidental disengagement.

Low-slope Roof: A roof having a slope less than or equal to 4 in 12 vertical to horizontal.

Lower level: Those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.

Maintenance: Work that is anticipated, routine, and done on a regularly scheduled/periodic basis to help maintain the original condition of the component.

Mechanical Equipment: All motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mop carts.

Non Self-Locking Snap Hooks: Gated connectors that do not automatically self-lock (i.e. climbing carabineers).

Opening: A gap or void 30 inches high or more and 18 inches wide or more, in a wall or partition through which employees can fall to a lower level.

Overhand Bricklaying and Related Work: The process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. Related work includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.

Personal Fall Arrest System (PFAS): A system used to arrest an employee in a fall from a working level.

Personal Fall Restraint System (PFRS): A combination of anchorage, anchorage connector, lanyard (or other means of connection), and full body harness that limits travel in such a manner that the user is not exposed to a fall hazard.

Positioning Device System: A system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free.

Prime Contractor's Cognizant Safety Manager: A management representative that manages safety and health risks for the contractor that controls the facility, work scope, and task request.

Qualified Person: One who, by possession of a recognized degree, certification, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to the subject matter, the work, or the project.

Rope Grab: A deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Roof: The exterior surface on the top of a building. This does not include floors or formwork which, because a building has not been completed or is being demolished, temporarily becomes the top surface of a building.

Roofing Work: The hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

Safety-monitoring System: A fall protection system of warning lines in which a designated person (Safety Monitor) is responsible for recognizing and warning employees outside the warning lines of fall hazards. This system only applies to low-slope roofing work.

Safety Monitor: A Competent Person designated to recognize fall hazards and monitor the safety of other employees engaged in low-slope roofing work.

Safety Representative: Provides guidance and oversight to implement the Program requirements, including fall hazard control measures in a task-specific job hazard analysis.

Self-Locking Carabineer: A connector generally comprised of a trapezoidal or oval body with a self-locking gate or similar arrangement that may be opened to attach another object and, when released, automatically closes and locks to retain the object and is specially designed not to open accidently during a fall.

Self-retracting Lifeline/Lanyard (SRL): A deceleration (braking) device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement and which, after the onset of a fall, automatically locks the drum and arrests the fall.

Steep Roof: A roof having a slope greater than 4 in 12 (vertical to horizontal).

Toeboard: A low protective barrier that shall prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Unprotected Sides and Edges: Any side or edge (except at entrances to points of access) of a walking/working surface 6 feet or more above a lower surface or above dangerous operating equipment (i.e., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches high).

Walking/Working Surface: Any surface, whether horizontal or vertical, on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees are located in order to perform their job duties.

Warning Line System: A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge and which designates an area in which roofing work may take place without the use of guardrail or other fall arrest systems to protect employees in the area.

Work Area: The portion of a walking/working surface where job duties are being performed.

3.0. RESPONSIBILITIES

Project/Facility Director

- Ensures resources are available to implement the Program.
- Ensures line management and project employees are trained to comply with and implement the Program

Project Manager

- Verifies line management has been trained to implement the Program
- Ensures proper equipment is available.

Prime Contractor's Cognizant Safety Manager

- Approves exceptions to 29 CFR 1926.500(a)(1) where the people doing inspections, investigations, and assessments of conditions are not required to use fall protection
- Ensures the Fall Protection Competent Person(s) and Qualified Person(s) are designated
- Approves the FPWP

Cognizant Supervisor

- Verifies employees are trained to comply with and implement the Program
- Ensures completion of initial evaluation of work locations where unprotected fall hazards exist to address and resolve specific fall protection issues
- Ensures Fall Protection Spotter(s) and/or Fall Protection Safety Monitor(s) are designated, when required
- Develops/reviews the FPWP with the Safety Representative, Qualified Person (when required), Competent Person and an Authorized User
- Ensures performance of semi-annual inspections of all fall protection equipment based on the equipment manufacturer's requirements
- Ensures the FPWP is in the work control documents and reviewed with the Authorized User(s)
- Ensures Structural Roof Analysis has been completed in accordance with Prime Contractor's policy

Competent Person

- Performs periodic inspections of ongoing work to ensure compliance with the Program
- Provides technical expertise to line management to ensure compliance with the Program
- Performs initial evaluation of work locations where unprotected fall hazards exist
- Develops/reviews the FPWP with the Cognizant Supervisor, the Qualified Person (when required), and an Authorized User
- Provides recommendations to the Cognizant Supervisor regarding the type of fall protection required to protect employees who have the potential to be exposed to a fall
- Verifies that the installed fall protection systems are installed in accordance with the requirements of this Program
- Selects and supervises the installation of non-certified anchorages
- Conducts semi-annual inspection of fall protection equipment, to include removal of defective components from service and render them inoperable

Qualified Person

- Provides structural analysis, documentation, and approval for certified anchorages used for fall arrest, restraint, and positioning systems including lanyards and devices
- Designs and provides direction for the installation and use of horizontal lifelines

  NOTE: *Direction means instruction or guidance for making, using, etc.*

- Develops/reviews the FPWP, when required, with the Cognizant Supervisor, Competent Person, Safety Representative, and an Authorized User

Authorized User

- Completes initial and requalification fall protection/fall prevention training
- Inspects personal fall arrest equipment prior to use
- Performs work in compliance with the Program
- Develops/reviews the FPWP, when required, with the Cognizant Supervisor, Competent Person, Safety Representative, and Qualified Person (when required)
- Reports conditions that were not addressed on the FPWP
- Complies promptly to fall hazard warnings from the Safety Monitor and/or Fall Protection Spotter, when present

Safety Monitor

- Completes appropriate training in recognition of fall hazards
- Provides continuous monitoring of employees who are exposed to a fall during roofing work
- Remains within visual sighting distance of monitored employees
- Remains close enough to communicate with employees
- Takes prompt corrective measures to have the Authorized Users move away from the unprotected side or edge or use other work processes to avoid hazards
- Does not allow other responsibilities or distractions to interfere with monitoring activities

Fall Protection Spotter (See Appendix C: *Fall Protection Spotter [Non-Mandatory]*)

- Completes appropriate training in recognition of fall hazards
- Provides continuous monitoring of employees who could be exposed to a fall hazard
- Remains within visual sighting distance of monitored employees
- Remains close enough to communicate with employees
- Takes prompt corrective measures to have the Authorized Users move away from the unprotected side or edge or use other work processes to avoid hazards
- Does not allow other responsibilities or distractions to interfere with monitoring activities

4.0. REQUIREMENTS

4.1. Unprotected Walking/Working Surfaces (Including surfaces not otherwise addressed)

Employees on a walking/working surface (horizontal, vertical, or sloped) with an unprotected side or edge which is 6 feet or more above a lower level shall be protected from falling by the use of guardrail systems, personal fall restraint system (PFRS), or personal fall arrest system (PFAS).

4.2. Leading Edge Work

Employees who are constructing a leading edge 6 feet or more above lower levels shall be protected from falling by a guardrail system, PFRS, or PFAS.

Employees on a walking/working surface 6 feet or more above a lower level where leading edges are under construction, but who are not engaged in the leading edge work, shall be protected from falling by a guardrail system, PFRS, or PFAS. If a guardrail system is chosen to provide the fall protection, and a Controlled Access Zone (CAZ) has already been established for leading edge work, the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.

Individuals who are not performing leading edge work are not allowed in the CAZ.

4.3. Hoist Areas

Employees in a hoist area shall be protected from falling 6 feet or more to lower levels by a guardrail system, PFRS, or PFAS. The fall prevention system shall ensure the employee cannot fall into the opening.

If guardrail systems, or portions thereof, are removed to facilitate a hoisting operation (i.e., during landing of materials) and an employee must lean through the access opening or out over the edge of the access opening, the employee shall be protected from fall hazards by a PFRS. The system shall be defined in the FPWP.

4.4. Holes

Employees on walking/working surfaces shall be protected from falling through holes (including skylights, hatches, trap doors, hinged covers, etc.) more than 6 feet above lower levels as outlined in the FPWP. Acceptable forms of protection include covers (preferred where feasible), guardrail systems, PFRS, or PFAS.

Holes shall be protected at all times if the access level is occupied by personnel.

100% Fall Protection shall be used when accessing or egressing the fall hazard work area.

Material and tools shall be protected from falling through holes onto lower levels by a guardrail system with toeboard or covers (See Section 5.8, *Covers and Protection for Floor Openings, Roof Openings, Trap Doors, Skylights, Etc.*).

The preferred method of protecting open floor or roof openings, while accessing the opening, is to use a guardrail offset system.

4.5. Formwork and Reinforcing Steel

Employees on the face of formwork or reinforcing steel shall be protected from falling 6 feet or more to lower levels by a PFAS. If a positioning device system is used, a PFAS is also required as described in the FPWP.

4.6. Ramps, Runways, and Other Walkways

Employees on ramps, runways, and other walkways shall be protected from falling 4 feet or more to lower levels by guardrail systems.

4.7. Working Near Excavations

Employees at the edge of an excavation, including trenches, wells, pits, or shafts, 6 feet or more in depth shall be protected from falling by the design of the slope, guardrail systems, fences, barricades, or covers.
Employees working between the fall prevention and the fall hazard shall be protected from falling into the excavation by PFAS or PFRS as defined in the FPWP.

For further information regarding excavations see DOE-0344, *Hanford Site Excavating, Trenching, and Shoring.*

4.8. Dangerous Equipment

Employees less than 6 feet above dangerous equipment shall be protected from fall hazards by a guardrail system or equipment guard.

Employees 6 feet or more above dangerous equipment shall be protected from fall hazards by a guardrail system, PFRS, or PFAS as defined in the FPWP.

When personnel are working above vertical impaling objects, the impaling end shall be removed or adequately covered to eliminate the hazard.

4.9. Roofing Work and Roof Access

4.9.1. Accessing

Prior to personnel accessing any roof, verify an analysis of the roof's structural stability/integrity has been completed and any necessary protective measures have been identified and implemented.

4.9.2. Roofing Work on Low-Slope Roofs

Employees engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet or more above lower levels, shall be protected from falling by a:

- Guardrail system
- PFRS
- PFAS
- Warning line system and guardrail system
- Warning line system and PFAS, or
- Warning line system and safety monitoring system

On roofs 50 feet or less in width, the use of a safety monitoring system alone (i.e. without the warning line system) is permitted.

Specific fall protection steps shall be determined, described, and documented in the FPWP.

Warning lines shall be:

- Erected on all sides of the roof work area
- A minimum of 6 feet back from the edge
- A minimum of 10 feet back from the edge in the direction of travel if mechanical equipment is used on the roof
- Accessed by points connected to the work area by a path formed by two warning lines and shall be offset so employees cannot walk directly into the work area
- Flagged with high visibility materials at intervals of no more than 6 feet
- Rigged and supported (including sag) in such a manner that its lowest point is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface
- Attached to stanchions that will not tip over when a force of at least 16 pounds is applied horizontally against the stanchion 30 inches above the walking/working surface
- Attached to stanchions in such a manner that pulling on the line will not result in slack being taken up in adjacent sections before the stanchion tips over
- Able to support a tensile strength of 500 pounds without breaking

4.9.3. Steep Roofs

Employees on a steep roof with unprotected sides and edges 6 feet or more above lower levels shall be protected from falling by a guardrail system with toeboards, PFRS, or PFAS as defined in the FPWP.

4.10. Precast Concrete Erection

Each employee engaged in the erection of precast concrete members (such as the erection of wall panels, columns, beams, and floor and roof "tees") and related operations, such as grouting of precast concrete members, who is 6 feet or more above lower levels shall be protected from falling by a guardrail system, PFRS, or PFAS as defined in the FPWP.

4.11. Overhand Brick Laying and Related Work

Each employee performing overhand bricklaying and related work 6 feet or more above lower levels shall be protected from falling by a guardrail system, PFRS, PFAS, or shall work in a CAZ.

Each employee reaching more than 10 inches below the level of the walking/working surface shall be protected from falling by a guardrail system, PFRS, or PFAS.

Fall Protection shall be defined in the FPWP.

4.12. Wall Openings

Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 6 feet or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches above the walking/working surface, shall be protected from falling by the use of a guardrail system, PFRS, or PFAS as defined in the FPWP.

4.13. Aerial Lifts

When operating aerial lifts, a full body harness shall be worn and a lanyard attached to the manufacturer provided anchor point.

When exiting the aerial lift for access to an elevation an FPWP shall be completed. An FPWP is not required when working from an aerial lift within the guardrails.

NOTE: *Scissor lifts are considered mobile scaffolding by OSHA and therefore are addressed in Section 4.15,* Scaffolding*, of this Program.*

4.14. Cranes and Derricks

4.14.1. Crane Suspended Personnel Lift Platform

When using a crane suspended personnel lift platform fall protection shall be used in accordance with the Department of Energy (DOE)-RL-92-36, *Hanford Site Hoisting and Rigging Manual*. An FPWP is not required when the checklist is completed as directed in DOE-RL-92-36.

4.14.2. Fall Protection While Performing Maintenance, Repair, Inspection, Assembly, and/or Disassembly of Cranes and Derricks

Personal fall arrest system components shall be used in personal fall arrest and fall restraint systems and shall conform to the criteria of this Program.

The employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface of a crane or derrick with an unprotected side or edge more than 6 feet above a lower level.

The following requirement applies while performing non-assembly/disassembly maintenance, repair, or inspection of mobile cranes.

- For work other than erecting, climbing, and dismantling, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

The following requirement applies while performing assembly/disassembly of tower cranes and mobile cranes.

- For erecting, climbing, assembly/disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level.

4.15. Scaffolding

Scaffold erectors and dismantlers working at elevations above 10 feet shall have fall protection through the use of a guardrail, PFRS, or PFAS.

Scaffold users working at elevations above 6 feet shall have fall protection through the use of a guardrail, PFRS, or PFAS. Completion of the FPWP is not required for users working from approved scaffolding unless there is an unprotected fall hazard.

The guardrail system provides fall protection for scissor lifts. The equipment shall be used in accordance with manufacturer instructions and OSHA requirements. An FPWP is not required when working from a scissor lift within the guardrails. When exiting the scissor lift for access to an elevation an FPWP shall be completed.

Requirements relating to fall protection for employees working on scaffolds are provided in 29 CFR 1926, Subpart L, and company procedures.

4.16. Ladders

Fixed and Portable ladders used for access to elevations over 24 feet shall require fall protection.

If working from a ladder where the user is exposed to a fall hazard, the hazard shall be analyzed and documented in the FPWP.

4.17. Steel Erection

Any fall exposure of 6 feet or greater shall be addressed in the FPWP.

4.18. Protection from Falling Objects

Employees exposed to falling objects shall wear a hard hat and be protected with one or more of the following options:

- The area to which objects could fall shall be barricaded. Unauthorized employees shall be prohibited from entering the barricaded area.
- Objects that may fall shall be kept far enough away from the edge of a higher level so that those objects will not go over the edge if accidentally displaced.
- When using toeboards as falling object protection they shall be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below. Good housekeeping shall be maintained so materials cannot build up behind the toeboards creating a falling object hazard.
- If tools, equipment, or materials are piled higher than the top edge of a toeboard, then paneling or screening shall be erected from the

walking/working surface or toeboard to the top of a guardrail system's top rail or mid-rail, for a distance sufficient to protect employees below.

- When using canopies as falling object protection they shall be strong enough to prevent collapse and/or penetration by any objects which may fall on it.
- When using guardrail systems as falling object protection all openings shall be small enough to prevent passage of potential falling objects.
- Material stored inside buildings shall not be placed within 6 feet of any hoist way, exposed edge, or inside floor openings, or within 10 feet of any exterior wall which does not extend above the top of the material stored.
- All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse.
- During the performance of roofing work:
    - Materials and equipment shall not be stored within 6 feet of an edge unless guardrails are erected.
    - Materials which are piled, grouped, or stacked near an edge shall be stable and self-supporting.
    - Materials shall be secured or configured to prevent shifting due to inclement weather.

4.19. Inclement Weather

During inclement weather conditions (i.e., snow, ice, thunderstorms, lightning, wind) elevated work that requires the use of a fall protection system shall be evaluated by a Competent Person or stopped due to increased overall hazard potential. Work cannot be restarted without the approval of the Prime Contractor's Cognizant Safety Manager.

5.0. FALL PROTECTION SYSTEMS, CRITERIA, AND PRACTICES

5.1. Guardrail Systems

Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds applied within 2 inches below the top edge, in any outward or downward direction, at any point along the top edge.

Guardrail systems shall be surfaced to prevent injury to an employee from punctures or lacerations and to prevent snagging of clothing.

The ends of all top rails and mid-rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.

Top rails and mid-rails shall be at least one-quarter inch nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails it shall be flagged at not more than 6-foot intervals with high-visibility material.

Guardrail systems used at hoisting areas (a guardrail with an offset access, gate, or removable guardrail section) shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.

Guardrail systems used at holes or openings shall be erected on all unprotected sides or edges of the hole or opening.

When an accessible hole for the passage of materials is not in use, it shall be closed over with a cover or a guardrail system shall be provided along all unprotected sides or edges. When employees are working around the unprotected hole 100% Fall Protection is required.

Guardrail systems used around unprotected holes which are used as points of access (such as ladder ways) shall be provided with a gate or be so offset that a person cannot walk directly into the hole. Existing openings that are currently protected by chains shall have a top and mid chain. Facilities with existing openings that are used frequently (at least monthly), shall upgrade the opening to a gate or offset system.

Guardrail systems used on ramps and runways shall be erected along each unprotected side or edge.

Using a guardrail system, or any part thereof, as an anchor point is prohibited unless the anchorage point meets the requirements in Section 5.11 *Anchorages.*

Guardrails shall not be used as a walking/working surface, climbed on, or stood on.

Do not extend the upper body so that the center of gravity is beyond the guardrail system in an attempt to achieve additional reach to access the work source or area unless supplemental fall protection is used as determined in the FPWP.

5.1.1. Top Rails

The top edge height of top rails or equivalent guardrail system members shall be 42 inches (plus or minus 3 inches) above the walking/working level. When conditions warrant, the height of the top edge may exceed the 45-inch height and shall be specified in the FPWP.

NOTE: *When employees are using stilts or ladders the height of the adjacent top rail or equivalent member shall be increased an amount equal to the height of the walking/working level.*

5.1.2. Mid-rails

Mid-rails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working level when there is no wall or parapet wall at least 21 inches high.

Mid-rails shall be installed at a height midway between the top edge of the guardrail system and the walking/working level.

Screens and mesh, when used, shall extend from the top rail to the walking/working level and along the entire opening between top rail supports.

Mid-rails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding, without failure, a force of at least 150 pounds applied in any downward or outward direction at any point along the mid-rail or other member.

Intermediate vertical members (such as balusters), when used between posts, shall be no more than 19 inches apart.

Other structural members (such as additional mid-rails and architectural panels) shall be installed such that there are no openings in the guardrail system that are more than 19 inches wide.

5.1.3. Toeboards

Toeboards shall be capable of withstanding, without failure, a force of at least 50 pounds applied in any downward or outward direction at any point along the toeboard.

Toeboards shall be a minimum of 3.5 inches in vertical height from their top edge to the level of the walking/working level. They shall have no more than 0.25 inch clearance above the walking/working level. They shall be solid or have openings no more than 1 inch in their greatest dimension.

5.2. Personal Fall Arrest Systems (PFAS)

When stopping a fall PFAS shall:

- Limit maximum arresting force on an employee to 1,800 pounds when used with a body harness
- Be rigged so an employee cannot contact any lower level
- Limit maximum deceleration distance an employee travels to 3.5 feet
- Have sufficient strength to withstand twice the potential impact energy of an employee free-falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

The use of safety belts (body belts) for fall arrest is strictly prohibited.

The attachment point of the body harness shall be located in the center of the wearer's back or chest near shoulder level, or above the wearer’s head.

Body harnesses and components shall be used only for employee protection (as part of a PFAS, PFRS, or positioning device system) and not for any other purpose.

PFAS shall be used in accordance with manufacturer recommendations (i.e. not to be worn by pregnant women or minors, not to exceed maximum capacity, users with certain medical conditions, etc.).

PFAS and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee fall protection.

PFAS shall not be attached to guardrail systems or any part thereof, unless the anchorage point meets the requirements in Section 5.11 *Anchorages.*

PFAS shall not be attached to hoists without being addressed in the FPWP and with the approval of the Prime Contractor's Cognizant Safety Manager.

A PFAS is not to be used in a hoist area (Refer to Section 5.4, *Fall Restraint Systems*).

PFAS shall be inspected:

- By users prior to each use for wear, damage, and other deterioration
- Semi-annually by a properly trained Competent Person following manufacturer recommendations and the inspection shall be documented
- And defective components shall be rendered inoperable and removed from service by the Competent Person

5.3. Personal Fall Arrest System Components

PFAS components shall meet the requirements of OSHA 1926.502 (d).

5.4.Personal Fall Restraint Systems (PFRS)

PFRS shall be designed so that the employee cannot access the fall point. If an employee can fall more than a same level fall, the PFRS is not properly designed.

Employees working while using a PFRS shall wear a full body harness with the restraint line secured to the Dee-ring located between the shoulder blades or at the center of the chest.

When working at hoist areas (floor opening where hoisting is performed), a PFRS shall be used and rigged to allow the movement of the employee only as far as the edge of the walking/working level.

A self-retracting lanyard (SRL) shall not be used for fall restraint unless the SRL is shorter than the distance to the fall hazard.

Anchorages selected for restraint and travel restraint systems shall be capable of sustaining static loads applied in the direction permitted by the system of at least:

- 1,000 pounds for non-certified anchorages, or
- Two times the foreseeable force for certified anchorages

The use of safety belts (body belts) for fall restraint is strictly prohibited.

5.5. Positioning Device Systems

Positioning devices shall be rigged so an employee cannot free fall more than 2 feet.

Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.

Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration. Defective components shall be removed from service.

While using a positioning device when the employee is exposed to a fall 6 feet or greater a fall arrest system is also required, if the positioning system does not provide 100% fall protection.

The use of safety belts (body belts) as a positioning device is strictly prohibited.

5.6. Warning Line Systems

Warning line systems shall only be used while performing:

5.6.1. Low-slope Roofing and Construction Work

During low-slope roofing work and low-slope construction work:

- The warning line shall be erected around all open sides of the roof work area
- When mechanical equipment is not being used, the warning line shall be erected no less than 6 feet from the roof edge for roofing work
- When mechanical equipment is being used while performing low-slope roofing work only, the warning line shall be erected no less than 6 feet from the roof edge which is parallel to the direction of mechanical equipment operation, and no less than 10 feet from the roof edge which is perpendicular to the direction of mechanical equipment operation.
- Points of access, materials handling areas, storage areas, and hoisting areas shall be connected to the work area by an access path formed by two warning lines.
- When the path to a point of access is not in use a rope, wire, chain, or other barricade, equivalent in strength and height to the warning line, shall be placed across the path at the point where the path intersects the warning line erected around the work area or the path shall be offset so a person cannot walk directly into the work area.

Warning lines shall consist of ropes, wires, or chains and supporting stanchions erected as follows:

- The rope, wire, or chain shall be flagged at no more than 6-foot intervals with high-visibility material.
- The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches from the

walking/working surface and its highest point is no more than 39 inches from the walking/working surface.

- After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge.
- The rope, wire, or chain shall have a minimum tensile strength of 500 pounds, and after being attached to the stanchions shall be capable of supporting, without breaking, the loads applied to the stanchions as prescribed in the above paragraph.
- The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

No employee shall be allowed in the work area between a roof's edge and a warning line unless the employee is performing roofing work in that area. If the employee is working in the area between a roof's edge and a warning line, the employee shall be protected by a fall protection system. On roofs 50 feet or less in width the use of a Safety Monitoring System alone (i.e. without the warning line system) is permitted.

Mechanical equipment on roofs shall be used or stored only in areas where employees are protected by a warning line system, guardrail system, PFRS, or PFAS.

5.6.2. Non-Roofing Construction Work on a Low Sloped Roof

Construction work is allowed on low sloped roofs with a non-conforming guardrail system when all of the following requirements are met:

- A non-conforming guardrail 15 feet or more from the roof edge or hole shall consist of ropes, wires, or chains and supporting stanchions erected as follows:
  - The rope, wire, or chain shall be flagged at no more than 6-foot intervals with high-visibility material.
  - The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface.
  - After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge.
  - The rope, wire, or chain shall have a minimum tensile strength of 500 pounds, and after being attached to the stanchions shall

be capable of supporting, without breaking, the loads applied to the stanchions as prescribed in the above paragraph.
    - The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.
- No work or work-related activity is to take place in the area between the warning line and the hole or edge unless the employees are using another form of Fall Protection
- The employer effectively implements a work rule prohibiting the employees from going past the warning line

5.7. Controlled Access Zones (CAZ)

When used to control access to areas where leading edge or overhand brick laying work are taking place the CAZ shall be defined by a control line or any other means that restricts access.

When control lines are used, they shall be erected no less than 6 feet nor more than 25 feet from the unprotected or leading edge, except when erecting precast concrete members.

When erecting precast concrete members the control line shall be erected no less than 6 feet nor more than 60 feet, or half the length of the member being erected, whichever is less, from the leading edge.

The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

The control line shall be connected on each side to a guardrail system or wall.

When used to control access to areas where overhand bricklaying and related work are taking place:

- The CAZ shall be defined by a control line erected no less than 10 feet nor more than 15 feet from the working edge.
- The control line shall extend for a distance sufficient for the CAZ to enclose all employees performing overhand bricklaying and related work at the working edge and shall be approximately parallel to the working edge.
- Additional control lines shall be erected at each end to enclose the CAZ.
- Only employees engaged in overhand bricklaying or related work shall be permitted in the CAZ.

Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:

- Each line shall be flagged or otherwise clearly marked at no more than 6-foot intervals with high-visibility material.

- Each line shall be rigged and supported in such a way that its lowest point (including sag) is no less than 39 inches from the walking/working surface and its highest point is no more than 45 inches (50 inches when overhand bricklaying operations are being performed) from the walking/working surface.
- Each line shall have a minimum breaking strength of 200 pounds.

On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying operations, the CAZ shall be enlarged as necessary to enclose all points of access, material handling areas, and storage areas.

On floors and roofs where guardrail systems are in place, but need to be removed to allow overhand bricklaying work or leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed.

5.8. Covers and Protection for Floor Openings, Roof Openings, Trap Doors, Skylights, Etc.

All covers shall be verified that they are capable of supporting, without failure, at least twice the weight of the intended load that may be imposed on the cover at any one time.

For vehicle traffic areas, covers shall be verified that they are capable of supporting twice the maximum axle load of the largest vehicle expected to cross over it.

All covers shall be secured when installed to prevent accidental displacement by the wind, equipment, or employees.

All covers shall be marked with the wording "DANGER - HOLE COVER" to provide warning of the hazard.

NOTE: *This provision does not apply to cast iron manhole covers or steel grates used on streets or roadways.*

All covers protecting holes used for pipe penetration, electrical penetrations, etc., shall remain in place until the penetration is made.

All covers protecting holes providing access to an area shall remain in place unless being used for access. Immediately after the employee(s) access the elevated area, the cover shall be closed.

When an alternative to a cover is desired, or additional protection is required, the following options are available:

- Guardrail Offset System
- PFRS
- PFAS
- Guardrail System
- System developed by a Qualified Person

5.9. Safety Monitoring Systems

A Safety Monitoring System is only allowed for low-slope roofing activities without a guardrail system, PFRS, PFAS, or CAZ.

On roofs 50-feet or less in width the use of a Safety Monitoring System alone (i.e. without the warning line system) is permitted.

The Safety Monitoring System shall meet the following requirements:

- Each employee working in a Controlled Roofing Access Zone (CRAZ) shall comply with the safety monitor’s instructions.
- Each employee working in a CRAZ should always face the leading edge and should move on their hands and knees when possible.

The employer shall designate a Competent Person to be the Safety Monitor.

The employer shall ensure that the Safety Monitor complies with the following requirements:

- The Safety Monitor shall warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner.
- The Safety Monitor shall be on the same walking/working surface and within visual sighting distance of the employee(s) being monitored.
- The Safety Monitor shall be close enough to communicate orally with the employee(s).
- The Safety Monitor shall not have other responsibilities which could take the monitor's attention from the monitoring function.

Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in low-slope roofing work.

Only the employee(s) working within the safety monitoring system shall be allowed in the work area.

5.10. Life Lines

Life lines shall be protected against being cut or abraded.

Personnel installing lifelines shall be protected from falls at all times by the use of aerial lifts, SRL, or other attachment points specified in the work plan or the job hazard analysis. Exceptions shall be provided in the FPWP.

Life lines shall be inspected:

- By users prior to each use for wear, damage, and other deterioration.
- At least semi-annually by a Competent Person and inspections shall be documented. For manufactured systems follow manufacturer's recommendations. For Qualified Person designed systems inspect using the criteria defined by the Qualified Person.
- And defective components shall be rendered inoperable and removed from service by the Competent Person.

Horizontal Life Lines:

- On suspended scaffolds or similar work platforms, where horizontal lifelines which may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions.
- Horizontal lifelines shall be designed, installed, and used under the direction of a Qualified Person as part of a complete PFAS which maintains a safety factor of at least two.
- The design of horizontal life lines and its components shall be addressed in the FPWP.

Vertical Life Lines:

- Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds.
- When vertical lifelines are used, each employee shall be attached to a separate lifeline.
- Vertical life lines shall be installed under the direction of the Qualified Person identified in the FPWP.

EXCEPTION: *During the construction or demolition of elevator shafts, two employees may be attached to the same lifeline in the hoist way, provided both employees are working atop a car that is equipped with guardrails and the strength of the lifeline is 10,000 pounds (5,000 pounds per employee attached).*

SRL and Lanyards:

- SRL and lanyards shall meet the requirements of OSHA 1926.502 (d) and ANSI Z359.2.

5.11. Anchorages

When securing a PFAS to an anchorage above shoulder level is infeasible it shall be addressed in the FPWP with the exception of aerial lifts (including scissor lifts).

Non-certified anchorages used for attachment of personal fall arrest equipment shall be selected, installed, and used as follows:

- Selected and installed under the supervision of a Competent Person
- Installed and used independent of any anchorage being used to support or suspend platforms
- Capable of supporting at least 5,000 pounds per employee attached (See Appendix A: *Typical Anchorage Points*)

Certified anchorages shall be designed, installed, and used as follows:

- Under the direction of a Qualified Person
- Independent of any anchorage being used to support or suspend platforms
- As part of a complete PFAS which maintains a safety factor of at least two
- With calculations/engineering information available

The FPWP shall be completed to designate the allowed anchorages for fall arrest.

For fall restraint, the anchorage shall be a minimum of 1,000 pounds per person or twice the maximum anticipated load to restrict the employee's ability to reach the fall hazard.

When using a crane as an anchorage, see Appendix B: *Requirements for Using a Crane as a Fall Protection Anchorage Point*.

5.12. Connectors

Connectors shall meet the requirements of OSHA 1926.502 (d) and ANSI Z359.1.

5.13. Designated Areas (29 CFR 1910, General Industry Application Only)

To implement a designated area, the following requirements shall be met:

- The work shall be of a temporary nature, such as maintenance work on roof top equipment.
- Designated areas shall be established only on surfaces that have a low slope.
- The designated areas shall consist of an area surrounded by a rope, wire, or chain, and supporting erected in accordance with the criteria below:
- Strength Criteria:
    - After being erected with the line (such as rope, wire or chain) attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion. The force shall be applied 30 inches above the work surface and perpendicular to the designated area perimeter, and in the direction of the unprotected side or edge.

    - The line shall have a minimum breaking or tensile strength of 500 pounds, and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions.
    - The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.
- Height Criteria:
    - The line shall be installed in such a manner that its lowest point (including sag) is no less than 34 inches and no more than 39 inches from the work surface.
- Visibility Criteria:
    - The line forming the designated area shall be clearly visible from any unobstructed location within the designated area up to 25 feet away, or at the maximum distance a worker may be positioned away from the line, whichever is less.
- Location Criteria:
    - The stanchions shall be erected as close to the work area as permitted by the task.
    - The perimeter of the designated area shall be erected no less than 6 feet for maintenance from the unprotected side or edge.
    - When mechanical equipment is being used the line shall be erected no less than 6 feet for maintenance from the unprotected side or edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet from the unprotected side or edge which is perpendicular to the direction of mechanical equipment operation.
- Access to the designated area shall be accomplished by establishing a clear path formed by two lines attached to stanchions which meet the strength, height, and visibility requirements of this section.

6.0. FALL PROTECTION WORK PERMIT (FPWP)

An FPWP shall be:

- Required when
    - Exposed to a fall hazard
    - Working over dangerous equipment
    - Stipulated by a Qualified Person, the Safety Representative or a Competent Person
- Reviewed and signed by a team made up of the Cognizant Supervisor, the Qualified Person (when required), Competent Person, the Safety Representative, and an Authorized User
- Approved by the Prime Contractor’s Cognizant Safety Manager
- Signed by the Authorized Users prior to starting work
- Reviewed daily by the Authorized Users prior to starting work
- Documented on the approved form (A-6004-286)
- Part of the work planning documentation

Application of the 29 CFR 1926.500(a)(1), exception for the employees making inspections, investigations, or assessments of workplace conditions prior to start of work or after completion of work, is only allowed with the approval of the Prime Contractor's Cognizant Safety Manager.

An FPWP is not required when working from aerial lifts, scissor lifts or approved scaffolding.

If there is a fall hazard present or a fall protection method that is not addressed in the FPWP work shall be stopped until a new FPWP is developed and approved. Field modification of the FPWP is allowed with concurrence of the Competent Person for changes that are not an added fall hazard or an added fall protection method.

Any modifications of the FPWP shall be reviewed with the Authorized Users.

7.0. RESCUE

In situations where technical rescue may be necessary, the team developing the FPWP may decide to contact HFD to develop a rescue plan.

If an employee falls and is suspended from a PFAS the HFD Rescue Team shall be notified immediately by calling 911 or (509) 373-0911. Rescue plan shall be addressed in the FPWP.

When possible, the employee may perform self-rescue or co-workers may attempt rescue.

- The employee may use an engineered self-rescue process that was developed for the task.
- A qualified aerial lift operator may use the lift to retrieve a suspended employee, providing the lift is rated for the intended load.
- Only personnel trained in the use of rescue equipment and methods shall perform any other type of rescue.

HFD will direct the rescue upon arrival if the employee is still suspended.

The employee shall be evaluated by HFD and sent for further medical attention if necessary.

8.0. TRAINING

Personnel who may be exposed to a fall hazard shall receive applicable fall protection training prior to being exposed to the fall hazard.

- At a minimum, training shall comply with OSHA 1926.503, ANSI Z359.2, and this Program.
- Training shall include testing to ensure understanding by the personnel.

Personnel shall be retrained when any of the following occur:

- There are significant changes to the fall protection training requirements
- New fall protection equipment is utilized
- Employee exhibits inadequacies in knowledge or in the use of fall protection equipment

- Two years have passed since the last training
- There is a significant change to this Program

Competent Person Training:

- The Competent Person for Fall Protection shall be trained in accordance with ANSI Z359.2.
- Contractors shall be able to produce evidence of formal training and experience for evaluation prior to work activities requiring fall protection on the Hanford Site.

Qualified Person Training

- The Qualified Person for Fall Protection shall be trained in accordance with ANSI Z359.2.
- Contractors shall be able to produce evidence of formal training and experience for evaluation prior to work activities requiring fall protection on the Hanford Site.

9.0. COMPETENT/QUALIFIED PERSON CRITERIA

The company shall determine and document the level of safety management that will designate the competent and qualified persons. The responsibility for designating competent and qualified persons shall be at the Safety Manager level or above.

9.1.Competent Person

The Competent Person shall have:

- Knowledge of the applicable procedures and regulations as they relate to the fall protection assignment.
- Training as it relates to the fall protection assignment.
- Experience in recognizing existing and predictable hazards as it relates to the fall protection assignment.
- Management authorization to correct unsafe acts and conditions as it relates to the fall protection assignment.
- The ability to exercise authority in the elimination/control of hazards as it relates to the fall protection assignment.

9.2.Qualified Person

The Qualified Person shall have:

- A recognized degree, certificate or professional standing.
- Knowledge of the applicable procedures and regulations.
- Experience in solving or resolving problems relating to the subject matter, the work, or the project.

9.3.Documentation

The employer shall document the evaluation process for designating competent and qualified persons.

10.0. PROGRAM EVALUATION

10.1. Program Evaluation

The Mission Support Contractor (MSC) shall initiate a review of this program by convening a review team of contractor and labor representatives to verify the Program reflects current applicable regulations, lessons learned, consistency between contractors, and that best practices are considered (See Attachment 1, *Hanford Site Fall Protection Program Committee [HSFPP] Charter*). The first evaluation of the program shall occur 12 months after effective date. Subsequent program evaluations shall be conducted in accordance to the Charter by a team of contractor and labor representatives every 12 months or when site conditions or substantial changes to standards occur.

10.2. Evaluating Program Implementation Effectiveness

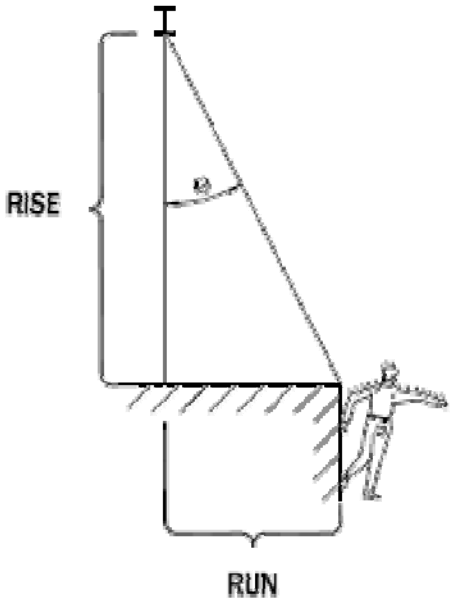
Each Hanford-Site Prime Contractor shall conduct ongoing evaluations of the workplace as necessary to ensure the Program is being effectively implemented and that it continues to be effective. The Program evaluation shall identify the strengths and deficiencies for each element of the Program along with recommendations for improvement. This evaluation shall be documented.

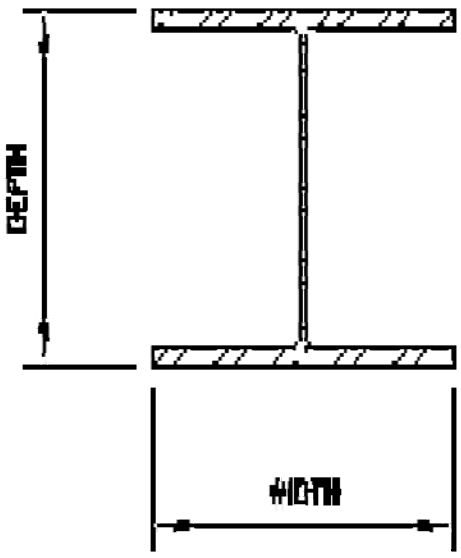
An initial evaluation shall occur within 12 months after effective date of the Program. Subsequent evaluations shall occur within 12 months of the previous evaluation. Contractors may utilize sources of information from third parties or other contractors to supplement their own evaluations.

Appendix A: Typical Anchorage Points

1. Structural:
   As described in the tables below, the following typical structural members, of the minimum size indicated or larger, may be used for fall arrest anchorage for one person with the following conditions:
   - The anchorages selected are primary structural members. Exclude lateral supports and bracings as anchorages.
   - The entire section must be fully engaged by the anchor arrest attachment, (such as a web/sling that goes over the beam or a beam clamp that centers the load on the center of rotation of the beam). The attachment cannot add a twisting movement to the member.
   - The end connectors develop the shear strength capable of withstanding the 5,000 pound load. A minimum end connection for the member is 2 inches of ¼-inch fillet weld or two 5/8-inch diameter bolts.
   - Because of potential failure from compression flange buckling, laterally unsupported beam spans are limited to 10 feet or less. Span is the length of the member between supported ends. For spans greater than 10 feet, the system must have lateral support. The support is the same size member as the structural member, is perpendicular to the direction of the structural member, and located at either the mid-span or at one-third increments along the length of the span. Other configurations, such as smaller members spaced at smaller increments, may qualify but should be verified by a structural engineer.
   - Consider existing structural loads in the assessment of potential anchorage points.

2. Where these supports are not available, a structural engineer should be consulted to recommend appropriate fall arrest anchorage locations.





5000 LB CONCENTRATED LOAD
ANCHORAGE FOR FALL ARREST EQUIPMENT

Max Span = 5 ft				Max Span = 10 ft				Max Span = 20 ft			
Tabulated Rise/Run	Depth	Width	Shape	Tabulated Rise/Run	Depth	Width	Shape	Tabulated Rise/Run	Depth	Width	Shape
No run	6	6	W6x15	No run	8	5.25	W8x18	No run	10	8	W10x33
(Vertical)	8	4	W8x10	(Vertical)	10	5.75	W10x22	(Vertical)	12	6.5	W12x26
	10	4	W10x12		12	6.5	W12x26		14	6.75	W14x30
	12	4	W12x14		14	5	W14x22		16	5.5	W16x26
	14	5	W14x22		16	5.5	W16x26		18	6	W18x35
	16	5.5	W16x26		18	6	W18x35		21	6.5	W21x44
6	6	6	W6x15	6	8	6.5	W8x24		24	7	W24x55
4	8	5.25	W8x18		16	5.5	W16x26	6	16	7	W16x36
2.5	14	5	W14x22	4	12	6.5	W12x26	6	21	6.5	W21x44
				3	14	6.75	W14x30	4	12	8	W12x40
2	10	5.75	W10x22		18	6	W18x35	4	24	7	W24x55
	16	5.5	W16x26	2	16	7	W16x36	4	14	8	W14x43
1	8	6.5	W8x24	1.5	10	8	W10x33	3	18	7.5	W18x50
	10	8	W10x33	1	12	8	W12x40	2	21	8.25	W21x62
	12	6.5	W12x26		14	8	W14x43	1.5	12	10	W12x53
	14	6.75	W14x30		16	10	W16x67	1.5	24	9	W24x68
	16	7	W16x36		18	7.5	W18x50	1	14	10	W14x61
									16	10	W16x67
									18	11	W18x76
									21	12.3	W21x101
									24	12.8	W24x104

3000 LB CONCENTRATED LOAD
ANCHORAGE FOR FALL RESTRAINT EQUIPMENT

Max Span = 5 ft				Max Span = 10 ft				Max Span = 20 ft			
Tabulated Rise/Run	Depth	Width	Shape	Tabulated Rise/Run	Depth	Width	Shape	Tabulated Rise/Run	Depth	Width	Shape
No run	4	4	W4x13	No run	5	5	W5x16	No run	8	6.5	W8x24
(Vertical)	5	5	W5x16	(Vertical)	6	6	W6x15	(Vertical)	10	5.75	W10x22
	6	4	W6x9		8	5.25	W8x18		12	6.5	W12x26
	8	4	W8x10		10	5.75	W10x22		14	5	W14x22
	10	4	W10x12		12	6.5	W12x26		16	5.5	W16x26
	12	4	W12x14		14	5	W14x22		18	6	W18x35
	14	5	W14x22		16	5.5	W16x26		21	6.5	W21x44
	16	5.5	W16x26		18	6	W18x35		24	7	W24x55
5	10	4	W10x12	5	8	5.25	W8x18	5	12	6.5	W12x26
4	12	4	W12x14	4	14	5	W14x22	4	14	6.75	W14x30
				2.5	10	5.75	W10x22	4	18	6	W18x35
					16	5.5	W16x26	2.5	16	7	W16x36
2	5	5	W5x16	1.5	8	6.5	W8x24		21	6.5	W21x44
1.5	6	6	W6x15	1.5	12	6.5	W12x26	2.5	10	8	W10x33
				1.5	18	6	W18x35	2	24	7	W24x55
1	8	5.25	W8x18	1	10	8	W10x33	1.5	12	8	W12x40
	10	5.75	W10x22		12	8	W12x40	1.5	14	8	W14x43
	12	6.5	W12x26		14	6.75	W14x30	1.5	18	7.5	W18x50
	14	5	W14x22		16	7	W16x36	1	12	10	W12x53
	16	5.5	W16x26		18	7.5	W18x50		14	10	W14x61
									16	10	W16x67
									18	11	W18x76
									21	8.25	W21x62
									24	9	W24x68

Appendix B: Requirements for Using a Crane as a Fall Protection Anchorage Point

1. If a crane is to be used as an anchorage point then an FPWP is required.

2. All crane manufacturer instructions shall be followed.

3. Use only a qualified crane operator, as defined in DOE-RL-92-36.

4. Competent Person will verify current monthly and annual inspection of the crane.

5. The crane shall be properly positioned and the pre-hook height determined approximately 10 feet above the working surface.

6. A qualified person (for crane operations) shall ensure crane control parameters are established using standard crane control setup procedures.

7. Ensure no load is suspended from the crane when the personal fall arrest system is anchored to the crane/derrick's hook (or other part of the load line).

8. Ensure the anchorage point is capable of sustaining a 5,000-pound load per person attached.

9. Self-retracting lanyard(s) shall be attached from the crane using suitable rigging hardware rated at a minimum 5,000-lbs nominal strength. Verify current inspection of rigging hardware if used as connection/attachment devices.

10. The crane operator shall be signaled to lower the hook to a level where the self-retracting lanyard can be attached to the crane hook. The crane hook shall then be raised back to the pre-determined height while holding "by hand" the self-retracting lanyard connection end.

    Note: *A good work practice is to not attach to the body harness D-ring while raising the crane hook.*

11. The crane operator shall set all travel brakes and locks, remain at the operator's station, and may leave the crane engine running.

12. Re-positioning of the attachment point (hook, boom or bridge) may be required. This shall be accomplished by moving the attachment point (hook, boom or bridge) in a slow controlled motion. The employee may either be attached (this is not a preferred method) or un-attached provided that 100% fall protection is maintained.

Appendix C: Fall Protection Spotter (Non-Mandatory)

A fall protection spotter is a designated person that monitors fall protection activities and reminds employees to use the proper fall protection as designated in the FPWP.

A fall protection spotter is an adjunct to fall protection and is not, in itself, a form of fall protection. The fall protection spotter is to support the existing fall protection used. A fall protection spotter may be used anytime workers are exposed to a fall. Some, but not all, activities that may use a fall protection spotter are when work is being performed in an area delineated by a warning line or control line system, when work is being performed around openings in roofs or floors, or when multiple employees are tied off and management wants someone extra to remind employees to use the prescribed fall protection. The fall protection spotter shall be used when designated in the FPWP.

A fall protection spotter shall have no duties other than watching the workers using fall protection.

If the fall protection spotter is required to leave the immediate vicinity, then all workers shall leave the area or an alternate trained fall protection spotter is assigned the duties.

Training requirements for a fall protection spotter are to be able to recognize the fall protection that is used for the immediate work being performed. The safety professional or the supervisor for the work may perform the training.

Attachment 1: Hanford Site Fall Protection Program Committee (HSFPP) Charter

The Hanford Site Fall Protection Program (HSFPP) Committee is established to serve as the advisory group providing consensus direction for the consistent administration and implementation of the HSFPP, herein called the Program. The participating contractors and organizations are responsible for appointing representatives to the committee.

The DOE Richland Operations Office (RL), Office of River Protection (ORP), and affected Contractors acknowledge that a joint committee provides the best approach for implementing a consistent, effective, and compliant interpretation of requirements for the Program. The parties agree to cooperate in a teambuilding manner to ensure that the full intent of the Program is met and will be responsibly carried out by their respective organizations.

1.0 Mission

The mission of the HSFPP Committee is to ensure consistent and standard application of the Program to promote and maintain a safe work environment. The Committee shall achieve this consistent approach through sharing best practices, lessons learned, and matters that affect multiple contractors to foster continuous improvement.

2.0 Committee Structure/Membership/Qualification

The Committee shall be comprised of two primary representatives each from the following prime contractors to the DOE at Hanford:

- Mission Support Contract (MSC)
- Plateau Remediation Contract (PRC)
- River Corridor Contract (RCC)
- Tank Operations Contract (TOC)

One representative shall be the contractor's Technical Representative for the FPPDC Program as determined by their contractor; the second representative shall be a Hanford Atomic Metal Trades Council (HAMTC) representative (as appointed by the HAMTC President or delegate).

In addition, one representative each from the following organizations shall be appointed to serve on the Committee:

- Central Washington Building and Construction Trades Council (CWB&CTC) (as approved by the Union President or delegate)
- HAMTC

These representatives comprise the voting membership. An alternate member shall be identified to serve during any absence of a primary representative. The alternate shall have the same authority as the primary representative.

Representatives from Volpentest HAMMER Training and Education Center (HAMMER) shall attend meetings as non-voting members to address matters pertaining to their respective areas of responsibility. An alternate member shall be identified to serve during any absence of a primary representative.

A Committee member's length of duty may be indeterminate, but rotation of representative assignments is encouraged by all parties.

A chair and co-chair shall be elected by a simple majority by the voting membership of the Committee every two years. The chair and co-chair may be reelected to their respective positions.

Meetings shall be open to others to observe and to give their organizations' impact, perspectives, and technical advice for consideration of the voting body, however, participation in consensus decisions resides solely with the Committee members described herein. The Committee has the authority to develop sub-committees and invite ad hoc participants as needed.

Representatives of RL and ORP shall be invited to participate at each meeting as non-voting attendees.

The MSC shall provide a recording secretary for the Committee. The recording secretary shall be a non-voting position that provides administrative support to the chairperson. A facilitator shall be provided by the MSC as requested by the Committee.

3.0 Functions of the FPPDC

The functions of the Committee shall be:

- Assist the MSC with the maintenance of the written Program;
- Communicate and submit Program changes to RL and ORP through the MSC;
- Maintain the Committee charter and review annually;
- Review and verify that training is consistent and appropriately covers the content of the FPPDC;
- Evaluate trends in performance and recommend actions for improvement;
- Review fall protection related events, issues, and lessons learned as appropriate;
- Ensure distribution of lessons learned as necessary;
- Evaluate and recommend resolution for issues/disputes pertaining to the Program;
    - Issues shall not include any actions regarding applicable Collective Bargaining Agreements.
- Recommend topics/information for communication to the workforce; and
- Provide Program status to the Senior Management Team (SMT) and DOE management when requested.

4.0 Roles and Responsibilities

4.1. Chair Roles and Responsibilities

- Schedule meetings.
- Facilitate meetings in an orderly fashion.
- Limit disruptions.
- Ensure meeting agendas are prepared.
- Ensure meeting minutes are taken and comments are documented.

- Function as a point of contact and spokesperson for the Committee.
- Interface with other site-wide safety program committees as necessary.
- Ensure action item list is maintained and members complete their assignments in a timely manner.
- Coordinate assignments of sub-committee(s).

4.2.Co-Chair Roles and Responsibilities

- Act as the Chair when the Chair is absent.
- Perform roles and responsibilities as delegated by the Chair.

4.3. Member Roles and Responsibilities

- Provide the chairperson with the identity of an alternate Committee member who is designated as the organizational representative.
- Attend and participate in meetings when scheduled or notify their alternate when unable to attend.
    - Alternates are responsible to attend and participate in meetings when the primary cannot attend.
    - If the primary and alternate are both unable to attend, the Chair shall be notified.
- Foster communication between the Committee and affected organizations relative to issue identification, interpretations, and consensus resolution.
- Work in good faith toward consensus on issues without compromising safety or Program compliance.
- Maintain a safety and requirements focus when addressing issues; avoid facility, craft, job function, or contractor biases when participating in discussions or voting.
- Maintain current knowledge of the requirements of the Program.
- Participate in issue discussions representing respective organization.
- Bring up issues or speak in discussions only after being recognized by the chairperson.
- Listen respectfully and refrain from interrupting others.
- Refrain from disruptive side conversations.

5.0 Meetings

- Meet regularly as necessary, but no less than annually, via scheduled meetings.
- Hold special meetings to address urgent or emerging issues.
- MSC shall record and retain meeting minutes and action items, and distribute to the membership, alternates, and DOE.
- MSC shall document and maintain record copies of voting decisions.

6.0 Meeting Agenda

- The chairperson shall ensure an agenda is prepared for each meeting, using input from the membership, and forward a copy to all members, alternates, and DOE in advance of the meeting time and date.
- Action items shall be assigned and tracked.

7.0 Quorum and Voting

The Committee shall be considered to have a quorum when all Committee members who are eligible to vote (or their designated alternates) are present. One or more dissenting votes from the voting membership shall be cause for an issue to elevate into a secondary phase of discussion and comment.

8.0 Secondary Phase of Discussion and Issue Resolution

Matters not agreed upon by the Committee through the initial voting process shall be elevated to the secondary phase of discussion. This phase may include up to two additional meetings. Further discussion/investigation beyond the two additional meetings may be conducted if there is unanimous agreement by the Committee.

If consensus cannot be reached by the Committee, the issue may be elevated to the SMT and/or DOE. The SMT shall provide a status of their resolution process to the Committee at scheduled meetings.

John G. Lehew III, President and
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CH2MHill Plateau Remediation Company

J. Frank Armijo, President and General Manager
Mission Support Alliance, LLC

M.N. Brosee, President
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